M1-Molecular and Cellular Biology (MCB)
Internship Proposal Form
Chemistry-Biology Department

(Deadline Friday 1st November 2018)

Laboratory Address and Affiliation:

Institut de Biologie Structurale
71, avenue des Martyrs, CS 10090 38044 Grenoble

Laboratory/Team Research area (Keyword)

Electron Microscopy and Method group directed by Dr. Guy Schoehn
Research area: electron microscopy, negative strand RNA virus, hantavirus, nucleocapsid, RNA polymerase, replication, transcription.

Summary of the Proposed Internship Project (10 lines)

Title: **Structural characterization of Hantaan virus nucleocapsid by single particle cryo-electron microscopy and/or cellular electron microscopy**

Description:
Hantaviruses belong to the Bunyaviridae family, a large family of viruses that possess a segmented RNA genome of negative sense polarity. Each genome segment is enwrapped with the viral nucleoprotein N forming a ribonucleoprotein complex, called the nucleocapsid. This complex is essential in the viral cycle and protects the viral genetic information from the environment while providing a flexible helical template for viral transcription and replication by the viral RNA polymerase. The proposed Master I project will consist in the structural analysis of Hantaan virus nucleocapsids. Depending on his/her preference and on advances of the project at the time of the internship, the intern will be given two options:

1. express suitable constructs of recombinant Hantaan nucleoproteins, optimize their purification and analyse the resultant recombinant nucleocapsids by single-particle cryo-electron microscopy. We already have results showing that recombinant Hantaan nucleocapsids are straight helices amenable to high-resolution by cryo-EM.
2. Analyse fixed and inactivated Tula hantaviruses (non-pathogenic to humans) by cryo-electron tomography or analyse cells infected by Tula hantaviruses using cellular EM. Inactivated Tula hantaviruses and fixed infected cells will be provided by a collaborator.

Methodologies and/or Techniques to be used

Option1: biochemistry (protein expression, purification), negative stain and cryo-electron microscopy (initiation), image processing.
Option2: cryo-electron tomography, sub-tomogram averaging, cellular electron microscopy.

Person to contact:

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Additional information

Proposal Form send as a PDF fil to: mohamed.benharouga@cea.fr

File has to be named as: name-Internship-M1-MCB-2019.pdf